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PATENT ABSTRACTS OF JAPAN

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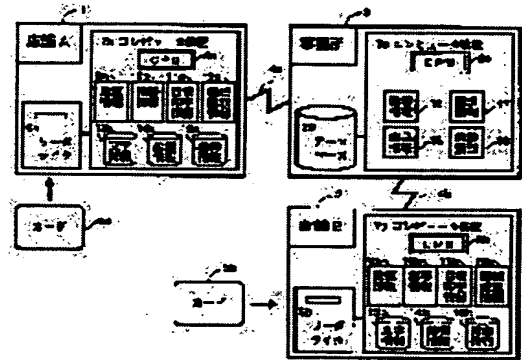
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(54) CARD AND CARD DISPLAY SYSTEM

(57)Abstract:

PROBLEM TO BE SOLVED: To improve the power of a card and its display system expression and to make information visually and sesuously recognizable by arranging numerical information related to the degree of achievement, etc., as character pattern information in the order of transition.

SOLUTION: When a card 5a is inserted into a reader/writer 6a, transition information is inputted from an IC module in the card 5a to a computer device 7a. When a pattern to be visual printing information is printed on a display part, the transition information is read out from the card 5a by the reader/writer 6a and inputted to the device 7a as transition information 10a. Then, numerical information is inputted. A retrieval table stored in retrieving information 15a is referred to, a message is selected from character information 13a based upon extracted information and a pattern is selected from pattern information 14a. Then, character information selected based upon the transition information and the selected pattern information are arranged. Visual printing information 11a is generated based upon the arrangement and printed on the display part.



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CLAIMS

[Claim(s)]

[Claim 1] The card characterized by arranging the pattern information and/or alphabetic information which were chosen based on numerical information in order of transition of the aforementioned numerical information, and displaying them on the aforementioned display in the card which has the display of visual printing information and the Records Department of the information in which machine read is possible which can rewrite.

[Claim 2] Card. Reader writer equipment and a computer apparatus. It is the card display system equipped with the above. The display of visual printing information which can rewrite the aforementioned card, It has the Records Department of the information including the transition information which shows transition of the aforementioned visual printing information in which machine read is possible. The informational rewriting function in which the aforementioned reader writer equipment was printed with the printing function to the aforementioned display of the aforementioned card, And it has the read function of the information from record and the aforementioned Records Department of the information to the aforementioned Records Department. The aforementioned computer apparatus memorizes two or more pattern information and/or two or more alphabetic information beforehand. The information which includes new transition information from the aforementioned transition information and the aforementioned numerical information while generating the visual printing information arranged in order of transition from the aforementioned pattern information chosen based on the aforementioned transition information and numerical information and/or two or more aforementioned alphabetic information and in which the aforementioned machine read is possible is generated. And while printing the visual printing information which controlled the aforementioned reader writer equipment and carried out [aforementioned] generation to the display of the aforementioned card, it is characterized by what the information which carried out [aforementioned] generation, and in which machine read is possible is recorded for on the Records Department of the aforementioned card.

[Claim 3] The aforementioned transition information is a card display system according to claim 2 characterized by being the numeric data which shows the stage of a display.

[Claim 4] The aforementioned numerical information is a card display system according to claim 2 or 3 characterized by being the information which shows the degree of achievement.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[The technical field to which invention belongs] this invention belongs to the technical field using a card of a system. this invention by giving energy, such as heat, light, MAG, and electrical and electric equipment The rewritable visual printing information-display function in which record and elimination of visual printing information can be performed, The information record function in which machine read, such as the magnetic information-storage section by the magnetic-recording method or the electric information-storage section like IC module for IC cards, is possible, Or it is related with the card display system which gives possible enough a visual indication of the transfer of the storage information about the degree of achievement to a user, using a card like the optical information Records Department of an optical card optically equipped with the information record function in which write reading is possible.

[0002]

[Description of the Prior Art] As a use gestalt of the service information to a customer, the so-called point card system is known, for example, JP,2-34079,B is mentioned. The publication about a system which performs management of carrying out demerit mark elimination of the point which a customer accepted giving one's service with a host computer through the reader writer equipment for magnetic cards from the point which the technology about the dealings mark settlement-of-accounts system by the magnetic card is indicated by this official report, and wrote the point defined beforehand giving its service in a magnetic card according to the amount-of-money quantity at the time of a customer doing some shopping, and was already written in giving its service is seen.

[0003] About the technology displayed that a customer understands the service information to a customer, JP,61-273663,A is mentioned, for example. The technology about the accumulating-totals point display system to a receipt top is indicated by this official report.

[0004]

[Problem(s) to be Solved by the Invention] Although the effect that managing the service information to a customer using a computer is indicated, and the above Prior arts improve the improvement in the function manager by the side of a dealer or the increase in efficiency of business is seen, if a customer does not go to a store equipped with reader writer equipment, with the magnetic card indicated by JP,2-34079,B, the technical problem that service information cannot know occurs from a magnetic card itself.

[0005] Moreover, although ** service information can be once known by recording service information, such as the accumulating-totals point, on a receipt which is indicated by JP,61-273663,A if a customer looks at the receipt, the receipt itself is mere printed matter, the once printed information cannot be rewritten but a customer has the technical problem that the need for collecting the receipt concerned etc. arises. Furthermore, in a Prior art, as information which a customer receives, it stops at the information about mere service mark, and the technical problem that the added value which a customer receives through service information is missing occurs.

[0006] Then, the purpose of this invention is enough to enable the transfer of the numerical

information about the degrees of achievement, such as results of an achievement test, and quiz, a clear actual result of a game, etc. by the method whose power of expression improves more not to mention point addition or accumulation. Moreover, it is various kinds of applications which apply this invention, and is using for a lighting means in case the owner of a card who attained a certain matter receives a privilege etc., and making much more service provision possible at a card user.

[0007]

[Means for Solving the Problem] The above-mentioned purpose is attained by the following this invention. That is, this invention is "a card which is arranged in order of transition of the pattern information and/or alphabetic information which were chosen based on numerical information of the aforementioned numerical information in the card which has the display of visual printing information and the Records Department of the information in which machine read is possible which can rewrite, and is displayed on the aforementioned display." Since according to the card of this invention the pattern information and/or alphabetic information which were chosen based on numerical information are arranged in order of transition of numerical information and displayed on the display of visual printing information, cognition becomes possible visually and sensuously about expression, and the numerical information about the degree of achievement etc. can fully be transmitted.

[0008] "It is the card display system which consists of a card, reader writer equipment, and a computer apparatus. this invention The display of visual printing information which can rewrite the aforementioned card, It has the Records Department of the information including the transition information which shows transition of the aforementioned visual printing information in which machine read is possible. The informational rewriting function in which the aforementioned reader writer equipment was printed with the printing function to the aforementioned display of the aforementioned card, And it has the read function of the information from record and the aforementioned Records Department of the information to the aforementioned Records Department. The aforementioned computer apparatus memorizes two or more pattern information and/or two or more alphabetic information beforehand. The information which includes new transition information from the aforementioned transition information and the aforementioned numerical information while generating the visual printing information arranged in order of transition from the aforementioned pattern information chosen based on the aforementioned transition information and numerical information and/or two or more aforementioned alphabetic information and in which the aforementioned machine read is possible is generated. While printing the visual printing information which controlled the aforementioned reader writer equipment and carried out [aforementioned] generation to the display of the aforementioned card, it is and the card display system which records the information which carried out [aforementioned] generation, and in which machine read is possible on the Records Department of the aforementioned card."

[0009] According to the card display system of this invention, a card has the display of rewritable visual printing information, and the Records Department of the information including the transition information which shows transition of the aforementioned visual printing information in which machine read is possible, and it can perform printing and rewriting of visual printing information to a display while the information in which machine read is possible is recorded on the Records Department by the reader writer. Moreover, since this visual printing information is generated from the pattern information and/or alphabetic information which were chosen by the computer apparatus based on the aforementioned transition information and numerical information, visual printing information can generate transition of numerical information, the content of numerical information, and the meaning that they have in the format which can enough be transmitted to the user of a card. In addition, the information including the transition information recorded on the Records Department in which machine read is possible can be constituted so that it may write in and (computer apparatus of an office) read to a host computer etc. based on ID of a card. Although the purpose can be attained by memorizing to either the Records Department or a host computer, the security to informational disappearance and an informational alteration improves by memorizing the same information to both.

[0010] Moreover, this invention is "a card display system whose aforementioned display information is numeric data which shows the stage of a display." According to this invention, as compared with the case where the visual printing information is made into display information etc., data capacity can be made very small. Moreover, this invention is "a card display system whose aforementioned numerical information is information which shows the degree of achievement." According to this invention, since numerical information is information which shows the degree of achievement, it can fully transmit the degree of achievement to the user of a card. This invention shows the remarkable operation effect especially, when transmitting the degree of achievement.

[0011]

[Embodiments of the Invention] Hereafter, the gestalt of operation explains this invention.

Drawing 1 is drawing showing an example of the whole composition to which the card display system of this invention was applied. It is the card of communication lines, such as LAN (Local Area Network) and a public line, and this invention used for 5b for the card display system of this invention, setting the office which the store A in which, as for 1 and 2, the card display system of this invention is installed, Store B, and 3 are connected by those stores and communication lines in drawing 1, and serves as an information center, and 4a and 4b to 5a, and setting. Moreover, in each stores A and B and an office, 6a and 6b are the reader writer of Cards 5a and 5b, and a computer apparatus 7a, 7b, and whose 7c are the components of a card display system.

[0012] Computer apparatus 7a, 7b, and 7c consist of details further, and 8a, 8b, and 8c are data-processing means which consist of CPUs (Central Processing Unit) etc. For 9a and 9b, in the computer apparatus 7a and 7b of each stores A and B, numerical information, and 10a and 10b are [visual printing information, and 12a and 12b of transition information, and 11a and 11b] machine reading information. These are adjustable information inputted with generating of events, such as dealings. Moreover, 13a and 13b are [pattern information and 15a and 15b of alphabetic information, and 14a and 14b] reference information. These are semipermanent information beforehand registered into computer apparatus 7a and 7b. Moreover, for 16, as for dealings information and 18, in computer apparatus 7c of an office, customer information and 17 are [goods information and 19] institution information. These information is arranged, and is registered into the database of 20, or is called if needed. Information shared, such as statistics analysis information on events, such as information for carrying out integrated management of each stores A and B etc. and dealings, is stored in a database 20.

[0013] Drawing 2 is drawing showing an example of the composition of the card used by the card display system of this invention. In drawing 2, the magnetic stripe to which, as for 21, magnetic recording is performed, IC module with which 22 has an IC memory, and 23 are the optical recording sections in which optical record and optical reading are performed. The Records Department in this invention consists of at least one of these magnetic stripes 21, the IC module 22, and the optical recording sections 23. Moreover, 24 is a display by which visual printing information is printed. The detail about the formation method of the display in which this rewriting is possible is mentioned later collectively. In addition, a display and the Records Department may exist in any of the same field of a card, or a different field.

[0014] Drawing 3 is drawing showing the display of the card used by the card display system of this invention, and an example of a display there. As for the display, the whole surface of one field of a card is assigned in drawing 3. In this example, both pattern of the face of two or more men who are around a display, and character of the message which is focusing on a display are printed by the display. As compared with drawing 3 (A), as shown in pattern 31e of a face, one pattern of drawing 3 (B) of a face is increasing, and as for the pattern of other faces, it remains as it is. Drawing 3 (A) shows the state in front of [of drawing 3 (B)] one, and a series of flows and increase in the pattern of a face show transition. Moreover, as for the message, rewriting is performed as shown in message 32a and message 32b.

[0015] Drawing 4 is the flow view showing the process of record to the display of the card in the card display system of this invention, and the Records Department. Next, based on drawing 1 - drawing 4, operation of the card of this invention and a card display system is explained. Since

above-mentioned drawing 1 is the case where the card display system of this invention is applied to a store as an example, in order that it may record the information on the point generated when a visitor does some shopping at a store on a card, card 5a is inserted in reader writer 6a. When the card display system of this invention is applied to the regular medical examinations in a medical institution etc., in order to record the information concerning a medical checkup instead of the information on the point, card 5a is inserted in reader writer 6a. When applied to the achievement test in a cram school, a school, etc., in order similarly to record the information concerning examination results instead of the information on the point, card 5a is inserted in reader writer 6a.

[0016] In the process of record to the display of a card and the Records Department which show drawing 4, if card 5a is inserted in reader writer 6a, transition information will be first inputted into computer apparatus 7a from the Records Department 22 of card 5a, for example, IC module. Transition information is information which shows transition of the visual printing information currently printed by the display of card 5a. If an example shown in drawing 3 explains, the stage before the start of transition information is numeric data which shows the state where nothing is printed by the display, for example, "0" is stored in the storing place of the transition information on the IC module 22. Next, when pattern 31a which is visual printing information is printed by the display, since it is a one-eyed pattern, "1" which shows the stage of the beginning of transition information will be stored in the storing place of transition information. Such transition information is read by card 5a to reader writer 6a, is inputted into computer apparatus 7a, and is set to transition information 10a (S1).

[0017] Next, numerical information 9a is inputted. Numerical information 9a is numerical information, such as information on the point mentioned above, information concerning a medical checkup, and information concerning examination results, and is a numeric value generated based on the event about each. With an example of drawing 3, it is examination results, and in the case of drawing 3 (A), a message shows that the last numerical information is 100 points, when the last numerical information is 60 points and drawing 3 (B). Such numerical information is inputted into computer apparatus 7a from a keyboard, a cash register, a bar code reader, etc., and is set to numerical information 9a (S2). In addition, although it explained that numerical information 9a was inputted by the above-mentioned explanation after transition information 10a was inputted, this turn is not limited, and it is same even if any are performed previously.

[0018] Next, reference of the reference table stored in reference information 15a (refer to drawing 1) is performed. A reference table is a table showing the information on the message corresponding to numerical information 9a, or a pattern. For example, it is a table as shown in the following table 1.

[Table 1]

Numerical information Message (alphabetic information) Pattern information 90-100 M110

P11070-89 M108 P10850-69 M106 P10630-49 M104 P104- - - - - [0019] In Table 1, a party is the group of the information on a bundle ball. For example, 70-89, (M108, P108), and ... are the groups of the information on a bundle ball. [90-100, (M110, P110),] Based on numerical information 9a, the group of the information on a bundle ball is extracted from a reference table. For example, when numerical information 9a is "100", (M110, P110) are extracted (S3).

[0020] By the way, the number of the reference tables stored in reference information 15a (refer to drawing 1) is not one, and they presuppose that there are more than one. That is, the information on a message or a pattern has accomplished the group and a case as existed in a reference table for every group of the is assumed. For example, a display as shown in drawing 3 is a display based on a certain group, and when based on other groups, it can completely perform another display. The place where numerical information 9a means based on which group it displays is determined. Therefore, with generating of numerical information 9a, by the place to mean, when transition information is "0", while inputting a group name, it memorizes to the Records Department, or when transition information is not "0", a group name can be read from the Records Department and a reference table can be referred to using it.

[0021] Next, it is based on having been extracted from the reference table (M110, P110), and a message and a pattern are chosen. "M110" of (M110, P110) and "P110" are the code

information for identifying a message and a pattern. A message is chosen from alphabetic information 13a based on "M110", and a pattern is chosen from pattern information 14a based on "P110" (S4). Next, the alphabetic information chosen based on transition information 10a and the selected pattern information are arranged. With an example shown in drawing 3, arrangement is decided that the pattern information chosen as the position which should next be printed based on transition information 10a is printed. Moreover, arrangement is decided that the alphabetic information from which the selected alphabetic information was chosen as the field after the message which is the information that it has printed was eliminated so that rewriting might be performed is printed (S5).

[0022] Next, visual printing information 11a is generated based on the above-mentioned arrangement. This visual printing information 11a is data of the printing image of the selected alphabetic information and the selected pattern information, and is usually generated as bit map data (S6). Next, based on numerical information 9a and transition information 10a, machine reading information 12a which is the information in which machine reading is possible is generated. Machine reading information 12a is data recorded on the Records Department. Machine reading information 12a may be the numerical information 9a itself, and numerical information 9a is arranged in that case at the last of the data array of the past numerical information. Since the data array of this numerical information is the transition information 10a itself, when machine reading information 12a is generated in this way, it can be regarded as transition information 10a being contained. Moreover, it may be total of the numerical information generated in the past, and in total, numerical information 9a is added to the total till then, and new total is generated. In this case, machine reading information 12a is constituted by this total and new transition information (S7).

[0023] Thus, visual printing information 11a and machine reading information 12a which were generated by computer apparatus 7a are outputted to reader writer 6a, and are outputted to card 5a by reader writer 6a. That is, visual printing information 11a is printed by the display (for example, display 24 of drawing 2), and machine reading information 12a is recorded on the Records Department (for example, the magnetic stripe 21 of drawing 2, the IC module 22, or the optical recording section 23).

[0024] while pattern 31e is printed with an example shown in drawing 3 in the printing area next to 31d of patterns — message "60 of message region 32a of drawing 3 (A) — at all — ** — already — 1 — going — " — message "100 of message region 32b of drawing 3 (B) — it ** and does its best at all — it rewrites to seed" (S8) Above, the explanation about operation of the card of this invention in the process of record to the display of a card and the Records Department and a card display system is finished. Next, operation of character pattern data, the card of this invention in the registration process of a translation table, and a card display system is explained.

[0025] Drawing 5 is the flow view showing the registration process of character pattern data and a translation table in the card and card display system of this invention. The alphabetic data is beforehand created as a text file using the editor, the word processor, the Japanese input front end processor, etc. Moreover, the pattern which pattern data created the figure file by Plot CAD similarly, or was drawn on paper is read with a scanner, and the image file is created. And an alphabetic data and pattern data are inputted into computer apparatus 7a. The alphabetic data and pattern data which were inputted are classified for every group, and the name in a code is attached for every unit in a group (S11). Next, a reference table is created. A reference table is a table as shown in Table 1, and consists of groups of the name of the pattern data chosen corresponding to numerical information, and the name of an alphabetic data. Such a reference table is created (S12). Next, an alphabetic data is stored in alphabetic information 13a, pattern data are stored in pattern information 14a, and a reference table is further registered into reference information 15a (S13).

[0026] Next, the composition method of the display of a card is explained.

(Low-molecular compound resin) A heating element layer is prepared on a plastics base material, the record layer which distributed the organic low-molecular matter granular in the poly membrane is prepared on it, and the display medium further covered by the protective layer is

proposed (for example, Provisional-Publication-No. 61-No. 258853 official report). If the record layer of the nebula state which consists of this compound resin is heated by the degree of moderate temperature, it will become transparent, and transparency is maintained even if it returns to a room temperature. However, if the thing of this state is shortly heated to an elevated temperature, even if it will be in an opaque nebula state and will return to a room temperature, the state is maintained, and a reversible change of state is shown. Therefore, if moderate temperature heating is carried out by the thermal head, a transparent character pattern will be recorded, and if the back of a record layer is made into black, it will be visualized as a black character. What is necessary is just to carry out heating at high temperature of the character portion, when eliminating this character. The typical thing of the combination of the above-mentioned resin has a salt vinyl acetate copolymer, alkyl acrylate and alkyl (meta) acrylate, a fluoride vinylidene system resin, a vinyl methyl ketone, a fluoride vinylidene system resin, etc., and should just make one side of the above-mentioned combination a low-molecular polymer at least.

[0027] (Leuco color) If the acid matter contacts the leuco color which has a lactone ring, a lactone ring will carry out ring breakage and will color. If an alkali contacts the leuco color currently colored, a lactone ring will be closed down and it will return to a colorless leuco. This reversible reaction can be attained by carrying out the temperature control of what mixed the **** coloring material in the colorless leuco color. Crystal-Violet lactone etc. is mentioned as a **** coloring material as the salt of a gallic acid and a high-class fatty amine, the salt of a dihydroxy benzoic acid and a fatty amine, and a leuco compound. Therefore, if the leuco color and the **** coloring material are made to hold in a record layer, it can be made to be able to color with a dynamic heat carrier like a thermal head, and can be made to decolorize with a static heat carrier like a hot calender roll and a heat printing die for corrugated fibreboard.

[0028] (Polymer liquid crystal) Change of the orientation state of a side-chain type polymer liquid crystal can be caused in reversible by heating/cooling. That is, if heating quenching of the side-chain type polymer liquid crystal in which the liquid crystal layer vitreous state became cloudy is carried out, it will change to the transparent liquid crystal of an isotropic phase vitreous state, and if heating **** of the liquid crystal of an isotropic phase vitreous state is carried out, it will return to the liquid crystal phase vitreous state of a basis. By using the above polymer liquid crystal for a record layer, by the thermal head, record is possible by about the same sensitivity as a thermal paper, and elimination can be performed using a heating roller etc.

[0029] (Liquid crystal / macromolecule bipolar membrane) Prepare liquid crystal / macromolecule bipolar membrane in a base material with conductivity, and the orientation of a liquid crystal molecule is made to cause and nebula-ize disorder by heating, and it can return to the orientation of a basis by electric-field impression, and can be made to transparency-ize. A certain smectic liquid crystal is enclosed with a microcapsule from the former as liquid crystal matter, and it is used so that it may distribute in macromolecule matrices, such as a polymethylmethacrylate, a polycarbonate, and polyvinyl alcohol. The record medium using this can do writing with heating meanses, such as a thermal head, and can be eliminated by impressing electric field using an electrode or corona discharge.

[0030] (Magnetic fine particles) The magnetic powder of the shape of flakes which induces a magnetic field, and the vehicle which makes it float are enclosed into a microcapsule, and the magnetic display medium which was made to fix the microcapsule with a binder on a black substrate, and formed the display is proposed (for example, publication-number 5-No. 16578 official report). The display of this display medium is in the state of a perpendicular magnetic field over a substrate, magnetic powder carries out perpendicular orientation, an incident light is absorbed by the substrate, it looks black, and the state is maintained. However, if a level magnetic field is given to a substrate, since level orientation of the magnetic powder will be carried out and the incident light to a substrate will be intercepted, a display looks bright. A character is recorded with the difference of this light and darkness. The magnetic head can perform writing of data to this display, and elimination. The aforementioned vehicle dissolves a polyvinyl butyral, a polymethacrylic acid ester, an ethyl cellulose, etc. in polar liquids, such as fatty acid ester, alcoholic ester, and oxy acid ester, and the hydrophobic liquid which are th

aliphatic series of low volatility, and the mixture of an aromatic hydrocarbon.

[0031] (Matter in which photochromism is shown) With a series of organic compounds which change to blue, purple, etc. from colorlessness or light yellow, and return to the color of a basis by ultraviolet rays or the visible ray of short wavelength in a dark place For example, various kinds of hydrazones, an osazone, a fulgide and a stilbene, and a salicylaldehyde, There are derivatives, such as a SUPIRO pyran and BIIMIDAZORIRU, and what presents thermochromism (the same reversible discoloration as the photochromism which happens with heat) with a solid-state or a solution, and the thing which shows piezochromism (reversible discoloration which occurs by pressurization) are in these.

[0032]

[Effect of the Invention] According to this invention, it is arranged not to mention point addition or accumulation as mentioned above in order of transition as character pattern information of the numerical information about the degrees of achievement, such as results of an achievement test, and quiz, a clear actual result of a game, etc. Therefore, power of expression improves, cognition becomes possible visually and sensuously, and numerical information can fully be transmitted to the user of a card. Moreover, with various kinds of applications which apply this invention, it can use for a lighting means in case the cardholder who attained a certain matter receives a privilege etc., and much more service provision can be made possible at a card user. Moreover, according to this invention whose display information is the numeric data which shows the stage of a display, as compared with the case where the visual printing information itself is made into display information etc., data capacity can be made very small. Moreover, according to this invention whose numerical information is information which shows the degree of achievement, the degree of achievement can fully be transmitted to the user of a card, and there is the remarkable operation effect especially.

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TECHNICAL FIELD

[The technical field to which invention belongs] this invention belongs to the technical field using a card of a system. In this invention, energy, such as heat, light, MAG, and electrical and electric equipment, is given. Therefore, the rewritable visual printing information-display function in which record and elimination of visual printing information can be performed, The information record function in which machine read, such as the magnetic information-storage section by the magnetic-recording method or the electric information-storage section like IC module for IC cards, is possible, Or it is related with the card display system which gives possible enough a visual indication of the transfer of the storage information about the degree of achievement to a user, using a card like the optical information Records Department of an optical card optically equipped with the information record function in which write reading is possible.

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PRIOR ART

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EFFECT OF THE INVENTION

[Effect of the Invention] According to this invention, it is arranged not to mention point addition or accumulation as mentioned above in order of transition as character pattern information of the numerical information about the degrees of achievement, such as results of an achievement test, and quiz, a clear actual result of a game, etc. Therefore, power of expression improves, cognition becomes possible visually and sensuously, and numerical information can fully be transmitted to the user of a card. Moreover, with various kinds of applications which apply this invention, it can use for a lighting means in case the cardholder who attained a certain matter receives a privilege etc., and much more service provision can be made possible at a card user. Moreover, according to this invention whose display information is the numeric data which shows the stage of a display, as compared with the case where the visual printing information itself is made into display information etc., data capacity can be made very small. Moreover, according to this invention whose numerical information is information which shows the degree of achievement, the degree of achievement can fully be transmitted to the user of a card, and there is the remarkable operation effect especially.

[Translation done.]

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TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention] Although the effect that managing the service information to a customer using a computer is indicated, and the above Prior arts improve the improvement in the function manager by the side of a dealer or the increase in efficiency of business is seen, if a customer does not go to a store equipped with reader writer equipment, with the magnetic card indicated by JP,2-34079,B, the technical problem that service information cannot know occurs from a magnetic card itself.

[0005] Moreover, although ** service information can be once known by recording service information, such as the accumulating-totals point, on a receipt which is indicated by JP,61-273663,A if a customer looks at the receipt, the receipt itself is mere printed matter, the once printed information cannot be rewritten but a customer has the technical problem that the need for collecting the receipt concerned etc. arises. Furthermore, in a Prior art, as information which a customer receives, it stops at the information about mere service mark, and the technical problem that the added value which a customer receives through service information is missing occurs.

[0006] Then, the purpose of this invention is enough to enable the transfer of the numerical information about the degrees of achievement, such as results of an achievement test, and quiz, a clear actual result of a game, etc. by the method whose power of expression improves more not to mention point addition or accumulation. Moreover, it is various kinds of applications which apply this invention, and is using for a lighting means in case the owner of a card who attained a certain matter receives a privilege etc., and making much more service provision possible at a card user.

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MEANS

[Means for Solving the Problem] The above-mentioned purpose is attained by the following this invention. That is, this invention is "a card which is arranged in order of transition of the pattern information and/or alphabetic information which were chosen based on numerical information of the aforementioned numerical information in the card which has the display of visual printing information and the Records Department of the information in which machine read is possible which can rewrite, and is displayed on the aforementioned display." Since according to the card of this invention the pattern information and/or alphabetic information which were chosen based on numerical information are arranged in order of transition of numerical information and displayed on the display of visual printing information, cognition becomes possible visually and sensuously about expression, and the numerical information about the degree of achievement etc. can fully be transmitted.

[0008] "It is the card display system which consists of a card, reader writer equipment, and a computer apparatus. this invention The display of visual printing information which can rewrite the aforementioned card, It has the Records Department of the information including the transition information which shows transition of the aforementioned visual printing information in which machine read is possible. The informational rewriting function in which the aforementioned reader writer equipment was printed with the printing function to the aforementioned display of the aforementioned card, And it has the read function of the information from record and the aforementioned Records Department of the information to the aforementioned Records Department. The aforementioned computer apparatus memorizes two or more pattern information and/or two or more alphabetic information beforehand. The information which includes new transition information from the aforementioned transition information and the aforementioned numerical information while generating the visual printing information arranged in order of transition from the aforementioned pattern information chosen based on the aforementioned transition information and numerical information and/or two or more aforementioned alphabetic information and in which the aforementioned machine read is possible is generated. While printing the visual printing information which controlled the aforementioned reader writer equipment and carried out [aforementioned] generation to the display of the aforementioned card, it is and the card display system which records the information which carried out [aforementioned] generation, and in which machine read is possible on the Records Department of the aforementioned card."

[0009] According to the card display system of this invention, a card has the display of rewritable visual printing information, and the Records Department of the information including the transition information which shows transition of the aforementioned visual printing information in which machine read is possible, and it can perform printing and rewriting of visual printing information to a display while the information in which machine read is possible is recorded on the Records Department by the reader writer. Moreover, since this visual printing information is generated from the pattern information and/or alphabetic information which were chosen by the computer apparatus based on the aforementioned transition information and numerical information, visual printing information can generate transition of numerical information, the content of numerical information, and the meaning that they have in the format

which can enough be transmitted to the user of a card. In addition, the information including the transition information recorded on the Records Department in which machine read is possible can be constituted so that it may write in and (computer apparatus of an office) read to a host computer etc. based on ID of a card. Although the purpose can be attained by memorizing to either the Records Department or a host computer, the security to informational disappearance and an informational alteration improves by memorizing the same information to both.

[0010] Moreover, this invention is "a card display system whose aforementioned display information is numeric data which shows the stage of a display." According to this this invention, as compared with the case where the visual printing information itself is made into display information etc., data capacity can be made very small. Moreover, this invention is "a card display system whose aforementioned numerical information is information which shows the degree of achievement." According to this this invention, since numerical information is information which shows the degree of achievement, it can fully transmit the degree of achievement to the user of a card. this invention shows the remarkable operation effect especially, when transmitting the degree of achievement.

[0011]

[Embodiments of the Invention] Hereafter, the gestalt of operation explains this invention.

Drawing 1 is drawing showing an example of the whole composition to which the card display system of this invention was applied. It is the card of communication lines, such as LAN (Local Area Network) and a public line, and this invention used for 5b for the card display system of this invention, setting the office which the store A in which, as for 1 and 2, the card display system of this invention is installed, Store B, and 3 are connected by those stores and communication lines in drawing 1, and serves as an information center, and 4a and 4b to 5a, and setting. Moreover, in each stores A and B and an office, 6a and 6b are the reader writer of Cards 5a and 5b, and a computer apparatus 7a, 7b, and whose 7c are the components of a card display system.

[0012] Computer apparatus 7a, 7b, and 7c consist of details further, and 8a, 8b, and 8c are data-processing means which consist of CPUs (Central Processing Unit) etc. For 9a and 9b, in the computer apparatus 7a and 7b of each stores A and B, numerical information, and 10a and 10b are [visual printing information, and 12a and 12b of transition information, and 11a and 11b] machine reading information. These are adjustable information inputted with generating of events, such as dealings. Moreover, 13a and 13b are [pattern information and 15a and 15b of alphabetic information, and 14a and 14b] reference information. These are semipermanent information beforehand registered into computer apparatus 7a and 7b. Moreover, for 16, as for dealings information and 18, in computer apparatus 7c of an office, customer information and 17 are [goods information and 19] institution information. These information is arranged, and is registered into the database of 20, or is called if needed. Information shared, such as statistics analysis information on events, such as information for carrying out integrated management of each stores A and B etc. and dealings, is stored in a database 20.

[0013] Drawing 2 is drawing showing an example of the composition of the card used by the card display system of this invention. In drawing 2, the magnetic stripe to which, as for 21, magnetic recording is performed, IC module with which 22 has an IC memory, and 23 are the optical recording sections in which optical record and optical reading are performed. The Records Department in this invention consists of at least one of these magnetic stripes 21, the IC module 22, and the optical recording sections 23. Moreover, 24 is a display by which visual printing information is printed. The detail about the formation method of the display in which this rewriting is possible is mentioned later collectively. In addition, a display and the Records Department may exist in any of the same field of a card, or a different field.

[0014] Drawing 3 is drawing showing the display of the card used by the card display system of this invention, and an example of a display there. As for the display, the whole surface of one field of a card is assigned in drawing 3. In this example, both pattern of the face of two or more men who are around a display, and character of the message which is focusing on a display are printed by the display. As compared with drawing 3 (A), as shown in pattern 31e of a face, one pattern of drawing 3 (B) of a face is increasing, and as for the pattern of other faces, it remains

as it is. Drawing 3 (A) shows the state in front of [of drawing 3 (B)] one, and a series of flows and increase in the pattern of a face show transition. Moreover, as for the message, rewriting is performed as shown in message 32a and message 32b.

[0015] Drawing 4 is the flow view showing the process of record to the display of the card in the card display system of this invention, and the Records Department. Next, based on drawing 1 - drawing 4, operation of the card of this invention and a card display system is explained. Since above-mentioned drawing 1 is the case where the card display system of this invention is applied to a store as an example, in order that it may record the information on the point generated when a visitor does some shopping at a store on a card, card 5a is inserted in reader writer 6a. When the card display system of this invention is applied to the regular medical examinations in a medical institution etc., in order to record the information concerning a medical checkup instead of the information on the point, card 5a is inserted in reader writer 6a. When applied to the achievement test in a cram school, a school, etc., in order similarly to record the information concerning examination results instead of the information on the point, card 5a is inserted in reader writer 6a.

[0016] In the process of record to the display of a card and the Records Department which show drawing 4, if card 5a is inserted in reader writer 6a, transition information will be first inputted into computer apparatus 7a from the Records Department 22 of card 5a, for example, IC module. Transition information is information which shows transition of the visual printing information currently printed by the display of card 5a. If an example shown in drawing 3 explains, the stage before the start of transition information is numeric data which shows the state where nothing is printed by the display, for example, "0" is stored in the storing place of the transition information on the IC module 22. Next, when pattern 31a which is visual printing information is printed by the display, since it is a one-eyed pattern, "1" which shows the stage of the beginning of transition information will be stored in the storing place of transition information. Such transition information is read by card 5a to reader writer 6a, is inputted into computer apparatus 7a, and is set to transition information 10a (S1).

[0017] Next, numerical information 9a is inputted. Numerical information 9a is numerical information, such as information on the point mentioned above, information concerning a medical checkup, and information concerning examination results, and is a numeric value generated based on the event about each. With an example of drawing 3, it is examination results, and in the case of drawing 3 (A), a message shows that the last numerical information is 100 points, when the last numerical information is 60 points and drawing 3 (B). Such numerical information is inputted into computer apparatus 7a from a keyboard, a cash register, a bar code reader, etc., and is set to numerical information 9a (S2). In addition, although it explained that numerical information 9a was inputted by the above-mentioned explanation after transition information 10a was inputted, this turn is not limited, and it is same even if any are performed previously.

[0018] Next, reference of the reference table stored in reference information 15a (refer to drawing 1) is performed. A reference table is a table showing the information on the message corresponding to numerical information 9a, or a pattern. For example, it is a table as shown in the following table 1.

[Table 1]

Numerical information Message (alphabetic information) Pattern information 90-100 M110

P11070-89 M108 P10850-69 M106 P10630-49 M104 P104- - - - - [0019] In Table 1, a party is the group of the information on a bundle ball. For example, 70-89, (M108, P108), and ... are the groups of the information on a bundle ball. [90-100, (M110, P110),] Based on numerical information 9a, the group of the information on a bundle ball is extracted from a reference table. For example, when numerical information 9a is "100", (M110, P110) are extracted (S3).

[0020] By the way, the number of the reference tables stored in reference information 15a (refer to drawing 1) is not one, and they presuppose that there are more than one. That is, the information on a message or a pattern has accomplished the group and a case as existed in a reference table for every group of this is assumed. For example, a display as shown in drawing 3 is a display based on a certain group, and when based on other groups, it can completely perform another display. The place where numerical information 9a means based on which group it

displays is determined. Therefore, with generating of numerical information 9a, by the place to mean, when transition information is "0", while inputting a group name, it memorizes to the Records Department, or when transition information is not "0", a group name can be read from the Records Department and a reference table can be referred to using it.

[0021] Next, it is based on having been extracted from the reference table (M110, P110), and a message and a pattern are chosen. "M110" of (M110, P110) and "P110" are the code information for identifying a message and a pattern. A message is chosen from alphabetic information 13a based on "M110", and a pattern is chosen from pattern information 14a based on "P110" (S4). Next, the alphabetic information chosen based on transition information 10a and the selected pattern information are arranged. With an example shown in drawing 3, arrangement is decided that the pattern information chosen as the position which should next be printed based on transition information 10a is printed. Moreover, arrangement is decided that the alphabetic information from which the selected alphabetic information was chosen as the field after the message which is the information that it has printed was eliminated so that rewriting might be performed is printed (S5).

[0022] Next, visual printing information 11a is generated based on the above-mentioned arrangement. This visual printing information 11a is data of the printing image of the selected alphabetic information and the selected pattern information, and is usually generated as bit map data (S6). Next, based on numerical information 9a and transition information 10a, machine reading information 12a which is the information in which machine reading is possible is generated. Machine reading information 12a is data recorded on the Records Department. Machine reading information 12a may be the numerical information 9a itself, and numerical information 9a is arranged in that case at the last of the data array of the past numerical information. Since the data array of this numerical information is the transition information 10a itself, when machine reading information 12a is generated in this way, it can be regarded as transition information 10a being contained. Moreover, it may be total of the numerical information generated in the past, and in total, numerical information 9a is added to the total till then, and new total is generated. In this case, machine reading information 12a is constituted by this total and new transition information (S7).

[0023] Thus, visual printing information 11a and machine reading information 12a which were generated by computer apparatus 7a are outputted to reader writer 6a, and are outputted to card 5a by reader writer 6a. That is, visual printing information 11a is printed by the display (for example, display 24 of drawing 2), and machine reading information 12a is recorded on the Records Department (for example, the magnetic stripe 21 of drawing 2, the IC module 22, or the optical recording section 23).

[0024] while pattern 31e is printed with an example shown in drawing 3 in the printing area next to 31d of patterns -- message "60 of message region 32a of drawing 3 (A) -- at all -- ** -- already -- 1 -- going -- " -- message "100 of message region 32b of drawing 3 (B) -- it ** and does its best at all -- it rewrites to seed" (S8) Above, the explanation about operation of the card of this invention in the process of record to the display of a card and the Records Department and a card display system is finished. Next, operation of character pattern data, the card of this invention in the registration process of a translation table, and a card display system is explained.

[0025] Drawing 5 is the flow view showing the registration process of character pattern data and a translation table in the card and card display system of this invention. The alphabetic data is beforehand created as a text file using the editor, the word processor, the Japanese input front end processor, etc. Moreover, the pattern which pattern data created the figure file by Plot CAD similarly, or was drawn on paper is read with a scanner, and the image file is created. And an alphabetic data and pattern data are inputted into computer apparatus 7a. The alphabetic data and pattern data which were inputted are classified for every group, and the name in a code is attached for every unit in a group (S11). Next, a reference table is created. A reference table is a table as shown in Table 1, and consists of groups of the name of the pattern data chosen corresponding to numerical information, and the name of an alphabetic data. Such a reference table is created (S12). Next, an alphabetic data is stored in alphabetic information 13a, pattern

data are stored in pattern information 14a, and a reference table is further registered into reference information 15a (S13).

[0026] Next, the composition method of the display of a card is explained.

(Low-molecular compound resin) A heating element layer is prepared on a plastics base material, the record layer which distributed the organic low-molecular matter granular in the poly membrane is prepared on it, and the display medium further covered by the protective layer is proposed (for example, Provisional-Publication-No. 61-No. 258853 official report). If the record layer of the nebula state which consists of this compound resin is heated by the degree of moderate temperature, it will become transparent, and transparency is maintained even if it returns to a room temperature. However, if the thing of this state is shortly heated to an elevated temperature, even if it will be in an opaque nebula state and will return to a room temperature, the state is maintained, and a reversible change of state is shown. Therefore, if moderate temperature heating is carried out by the thermal head, a transparent character pattern will be recorded, and if the back of a record layer is made into black, it will be visualized as a black character. What is necessary is just to carry out heating at high temperature of the character portion, when eliminating this character. The typical thing of the combination of the above-mentioned resin has a salt vinyl acetate copolymer, alkyl acrylate and alkyl (meta) acrylate, a fluoride vinylidene system resin, a vinyl methyl ketone, a fluoride vinylidene system resin, etc., and should just make one side of the above-mentioned combination a low-molecular polymer at least.

[0027] (Leuco color) If the acid contacts the leuco color which has a lactone ring, a lactone ring will carry out ring breakage and will color. If an alkali contacts the leuco color currently colored, a lactone ring will be closed down and it will return to a colorless leuco. This reversible reaction can be attained by carrying out the temperature control of what mixed the **** coloring material in the colorless leuco color. Crystal-Violet lactone etc. is mentioned as a **** coloring material as the salt of a gallic acid and a high-class fatty amine, the salt of a dihydroxy benzoic acid and a fatty amine, and a leuco compound. Therefore, if the leuco color and the **** coloring material are made to hold in a record layer, it can be made to be able to color with a dynamic heat carrier like a thermal head, and can be made to decolorize with a static heat carrier like a hot calender roll and a heat printing die for corrugated fibreboard.

[0028] (Polymer liquid crystal) Change of the orientation state of a side-chain type polymer liquid crystal can be caused in reversible by heating/cooling. That is, if heating quenching of the side-chain type polymer liquid crystal in which the liquid crystal layer vitreous state became cloudy is carried out, it will change to the transparent liquid crystal of an isotropic phase vitreous state, and if heating **** of the liquid crystal of an isotropic phase vitreous state is carried out, it will return to the liquid crystal phase vitreous state of a basis. By using the above polymer liquid crystal for a record layer, by the thermal head, record is possible by about the same sensitivity as a thermal paper, and elimination can be performed using a heating roller etc.

[0029] (Liquid crystal / macromolecule bipolar membrane) Prepare liquid crystal / macromolecule bipolar membrane in a base material with conductivity, and the orientation of a liquid crystal molecule is made to cause and nebula-ize disorder by heating, it can return to the orientation of a basis by electric-field impression, and the rarefaction can be carried out. A certain smectic liquid crystal is enclosed with a microcapsule from the former as liquid crystal matter, and it is used so that it may distribute in macromolecule matrices, such as a polymethylmethacrylate, a polycarbonate, and polyvinyl alcohol. The record medium using this can do writing with heating meanses, such as a thermal head, and can be eliminated by impressing electric field using an electrode or corona discharge.

[0030] (Magnetic fine particles) The magnetic powder of the shape of flakes which induces a magnetic field, and the vehicle which makes it float are enclosed into a microcapsule, and the magnetic display medium which was made to fix the microcapsule with a binder on a black substrate, and formed the display is proposed (for example, publication-number 5-No. 16578 official report). The display of this display medium is in the state of a perpendicular magnetic field over a substrate, magnetic powder carries out perpendicular orientation, an incident light is absorbed by the substrate, it looks black, and the state is maintained. However, if a level

magnetic field is given to a substrate, since the level orientation of the magnetic powder will be carried out and the incident light to a substrate will be intercepted, a display looks bright. A character is recorded with the difference of this light and darkness. The magnetic head can perform writing of data to this display, and elimination. The aforementioned vehicle dissolves a polyvinyl butyral, a polymethacrylic acid ester, an ethyl cellulose, etc. in polar liquids, such as fatty acid ester, alcoholic ester, and oxy acid ester, and the hydrophobic liquid which are the aliphatic series of low volatility, and the mixture of an aromatic hydrocarbon.

[0031] (Matter in which photochromism is shown) With a series of organic compounds which change to blue, purple, etc. from colorlessness or light yellow, and return to the color of a basis by ultraviolet rays or the visible ray of short wavelength in a dark place. For example, various kinds of hydrazones, an osazone, a fulgide and a stilbene, and a salicylaldehyde. There are derivatives, such as a SUPIRO pyran and BIIMIDAZORIRU, and what presents thermochromism (the same reversible discoloration as the photochromism which happens with heat) with a solid-state or a solution, and the thing which shows piezochromism (reversible discoloration which occurs by pressurization) are in these.

[Translation done.]

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is drawing showing an example of the whole composition to which the card display system of this invention was applied.

[Drawing 2] It is drawing showing an example of the composition of the card used by the card display system of this invention.

[Drawing 3] It is drawing showing the display of the card used by the card display system of this invention, and an example of a display there.

[Drawing 4] It is the flow view showing the process of record to the display of the card in the card display system of this invention, and the Records Department.

[Drawing 5] It is the flow view showing the registration process of character pattern data and a translation table in the card and card display system of this invention.

[Description of Notations]

1 Store A

2 Store B

3 Office

4a, 4b Communication line

5a, 5b Card

6a, 6b Reader writer

7a, 7b, 7c Computer apparatus

8a, 8b, 8c Processing means

9a, 9b Numerical information

10a, 10b Transition information

11a, 11b Visual printing information

12a, 12b Machine reading information

13a, 13b Alphabetic information

14a, 14b Pattern information

15a, 15b Reference information

16 Customer Information

17 Dealings Information

18 Goods Information

19 Institution Information

20 Database

21 Magnetic Stripe

22 IC Module

23 Optical Recording Section

24 Display

31a, 31b, 31c, 31d, 31e Pattern

32a, 32b Message

[Translation done.]

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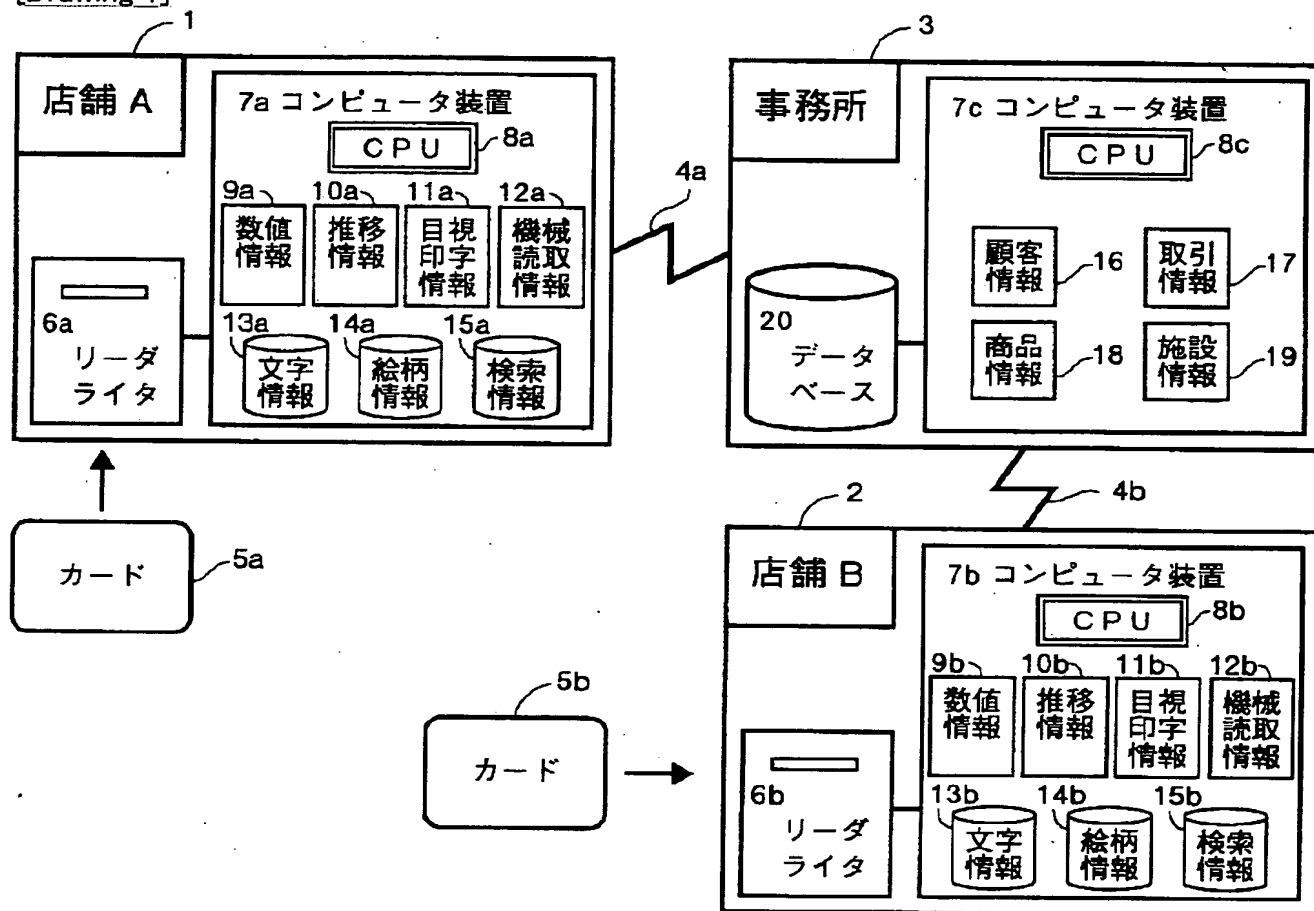
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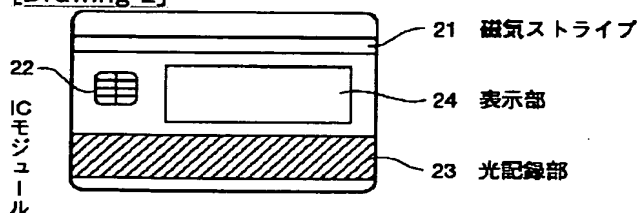
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DRAWINGS

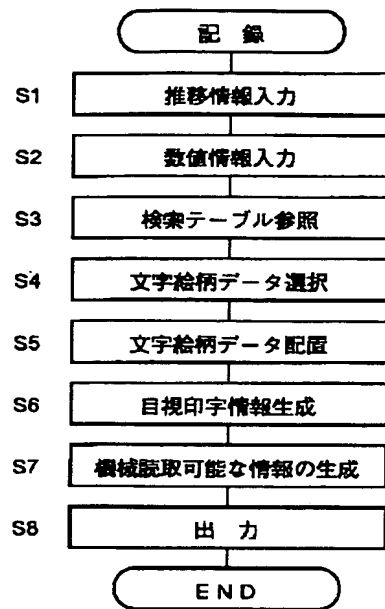
[Drawing 1]



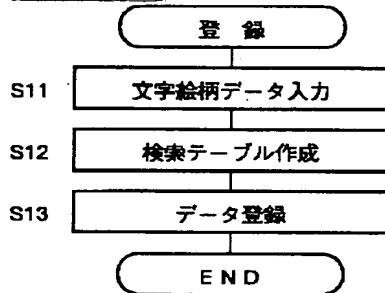
[Drawing 2]



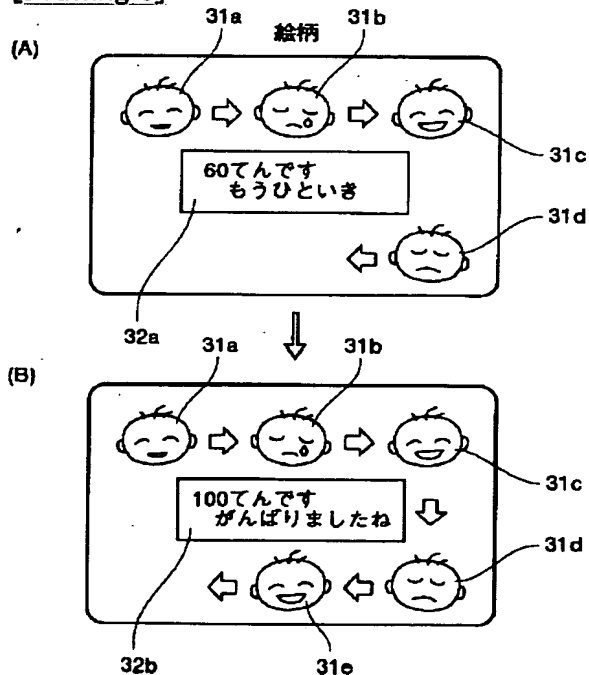
[Drawing 4]



[Drawing 5]



[Drawing 3]



[Translation done.]

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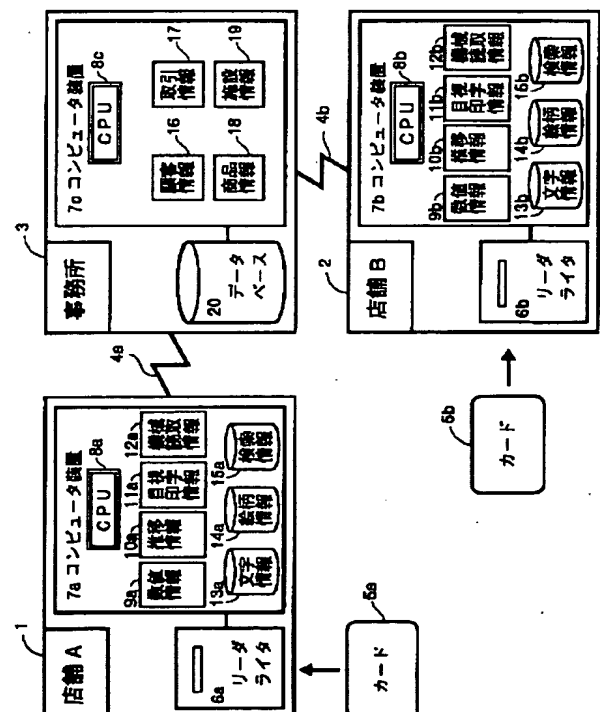
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(54)【発明の名称】 カードおよびカード表示システム

(57)【要約】

【課題】達成度等に関する数値情報を十分に伝達可能にする。

【解決手段】目視情報の表示部と機械読取り可能な情報の記録部を有するカードと、表示部への印字機能と記録部への情報の記録読取り機能を有するリーダライタ装置と、推移情報と数値情報に基づいて選択した絵柄情報および/または文字情報から推移の順番に配置した目視印字情報を生成しかつ推移情報と数値情報から新規の推移情報を含む前記機械読取り可能な情報を生成し、さらにリーダライタ装置を制御して表示部に目視情報を印字するとともに記録部に機械読取り可能な情報を記録するコンピュータ装置とからなるカード表示システム。および、その表示と記録が行われたカード。



【特許請求の範囲】

【請求項1】書換え可能な目視印字情報の表示部と機械読取り可能な情報の記録部を有するカードにおいて、数値情報に基づき選択された絵柄情報および／または文字情報が、前記数値情報の推移の順番に配置されて前記表示部に表示されていることを特徴とするカード。

【請求項2】カードと、リーダライタ装置と、コンピュータ装置とからなるカード表示システムであって、前記カードは書換え可能な目視印字情報の表示部と、前記目視印字情報の推移を示す推移情報を含む機械読取り可能な情報の記録部を有し、前記リーダライタ装置は前記カードの前記表示部への印字機能と印字された情報の書換え機能、および前記記録部への情報の記録と前記記録部からの情報の読取り機能を有し、前記コンピュータ装置はあらかじめ複数の絵柄情報および／または複数の文字情報を記憶し、前記推移情報と数値情報に基づいて選択した前記絵柄情報および／または前記複数の文字情報から推移の順番に配置した目視印字情報を生成するとともに前記推移情報と前記数値情報から新規の推移情報を含む前記機械読取り可能な情報を生成し、かつ前記リーダライタ装置の制御を行い前記生成した目視印字情報を前記カードの表示部に印字するとともに前記生成した機械読取り可能な情報を前記カードの記録部に記録することを特徴とするカード表示システム。

【請求項3】前記推移情報は表示の段階を示す数値データであることを特徴とする請求項2記載のカード表示システム。

【請求項4】前記数値情報は達成度を示す情報であることを特徴とする請求項2または3記載のカード表示システム。

【発明の詳細な説明】**【0001】**

【発明の属する技術分野】本発明はカードを利用するシステムの技術分野に属する。本発明は、熱、光、磁気、電気等のエネルギーを与えることにより、目視印字情報の記録や消去が行える書換え可能な目視印字情報表示機能と、磁気記録方式による磁気的な情報記憶部、もしくはICカード用ICモジュールのような電気的な情報記憶部等の機械読取り可能な情報記録機能、もしくは光カードの光情報記録部のような光学的に記録読取り可能な情報記録機能とを備えたカードを用いて、たとえば達成度に関する記憶情報を利用者へ十分に伝達可能に目視表示するカード表示システムに関するものである。

【0002】

【従来の技術】顧客に対するサービス情報の使用形態としては、いわゆるポイントカードシステムが知られており、例えば特公平2-34079号公報が挙げられる。同公報には磁気カードによる取引点数精算システムに関

する技術が開示されており、顧客が買い物をした際の金額高に応じて、予め定められたサービス点を磁気カードに書き込み、また、既に書き込まれたサービス点から顧客が受納したサービス点を減点消去する等の管理を、磁気カード用のリーダー・ライター装置を介してホストコンピュータで行うシステムについての記載が見られる。

【0003】顧客に対するサービス情報を顧客に分かるように表示する技術に関しては、例えば、特開昭61-273663号公報が挙げられる。同公報にはレシート上への累計ポイント表示システムに関する技術が開示されている。

【0004】

【発明が解決しようとする課題】以上のような従来の技術は、顧客に対するサービス情報をコンピュータを用いて管理することが記載されており、販売店側の管理機能の向上あるいは業務の効率化を改善するという効果はみられるが、特公平2-34079号公報に開示されるような磁気カードでは、顧客がリーダー・ライター装置の備えてある店舗に行かないと、磁気カードそのものからのみではサービス情報を知ることができないという課題がある。

【0005】また、特開昭61-273663号公報に開示されるようなレシート上に累計ポイント等のサービス情報を記録することで、顧客はそのレシートを見れば一応はサービス情報を知ることができるが、レシート自体は単なる印刷物であり、一旦印刷された情報を書き換えることはできず、顧客は当該レシートを貯めておく等の必要性が生ずるという課題がある。さらに、従来の技術では、顧客が受ける情報としては単なるサービス点数に関する情報に止まり、顧客がサービス情報を通して受ける付加価値に欠けているという課題がある。

【0006】そこで本発明の目的は、ポイント加算や累積はもちろんのこと、学力試験の成績、クイズやゲームのクリア実績、等の達成度等に関する数値情報をより表現力が向上する方法によって十分に伝達可能にすることである。また本発明を適用する各種のアプリケーションで、ある事柄を達成したカードの所有者等が特典を受ける場合の照明手段等に利用し、カード利用者に一層のサービス提供を可能とすることである。

【0007】

【課題を解決するための手段】上記の目的は下記の本発明によって達成される。すなわち、本発明は「書換え可能な目視印字情報の表示部と機械読取り可能な情報の記録部を有するカードにおいて、数値情報に基づき選択された絵柄情報および／または文字情報が、前記数値情報の推移の順番に配置されて前記表示部に表示されているカード」である。本発明のカードによれば目視印字情報の表示部には数値情報に基づき選択された絵柄情報および／または文字情報が、数値情報の推移の順番に配置されて表示されているから、表現を視覚的、感覚的に認知

可能となり達成度等に関する数値情報を十分に伝達することができる。

【0008】本発明は「カードと、リーダライタ装置と、コンピュータ装置とからなるカード表示システムであって、前記カードは書換え可能な目視印字情報の表示部と、前記目視印字情報の推移を示す推移情報を含む機械読取り可能な情報の記録部を有し、前記リーダライタ装置は前記カードの前記表示部への印字機能と印字された情報の書換え機能、および前記記録部への情報の記録と前記記録部からの情報の読取り機能を有し、前記コンピュータ装置はあらかじめ複数の絵柄情報および／または複数の文字情報を記憶し、前記推移情報と数値情報に基づいて選択した前記絵柄情報および／または前記複数の文字情報から推移の順番に配置した目視印字情報を生成するとともに前記推移情報と前記数値情報から新規の推移情報を含む前記機械読取り可能な情報を生成し、かつ前記リーダライタ装置の制御を行い前記生成した目視印字情報を前記カードの表示部に印字するとともに前記生成した機械読取り可能な情報を前記カードの記録部に記録する、カード表示システム」である。

【0009】本発明のカード表示システムによれば、カードは書換え可能な目視印字情報の表示部と、前記目視印字情報の推移を示す推移情報を含む機械読取り可能な情報の記録部を有し、リーダライタによって記録部に機械読取り可能な情報が記録されるとともに表示部に目視印字情報の印字と書換えを行うことができる。また、この目視印字情報はコンピュータ装置により前記推移情報と数値情報に基づいて選択された絵柄情報および／または文字情報から生成されるから、目視印字情報は数値情報の推移と数値情報の内容と、それらが有する意義をカードの利用者に十分に伝達可能な様式で生成することができる。なお記録部に記録される推移情報を含む機械読取り可能な情報は、カードのIDに基づきホストコンピュータ等（事務所のコンピュータ装置）に書込み、また読出すように構成することができる。記録部またはホストコンピュータ等のいずれかに記憶することにより目的を達成することができるが、両者に同一情報を記憶することにより情報の消失や改竄に対するセキュリティが向上する。

【0010】また本発明は「前記表示情報は表示の段階を示す数値データであるカード表示システム」である。この本発明によれば、目視印字情報そのものを表示情報とする場合等と比較してデータ容量を極めて小さくすることができる。また本発明は「前記数値情報は達成度を示す情報であるカード表示システム」である。この本発明によれば、数値情報は達成度を示す情報であるから達成度をカードの利用者に十分に伝達することができる。本発明は達成度を伝達する場合に特に顕著な作用効果を示す。

【0011】

【発明の実施の形態】以下、本発明について実施の形態により説明する。図1は本発明のカード表示システムが適用された全体構成の一例を示す図である。図1において、1、2は本発明のカード表示システムが設置されている店舗A、店舗B、3はそれらの店舗と通信回線により接続され情報センターとなる事務所、4a、4bはLAN (Local Area Network) や公衆回線等の通信回線、5a、5bは本発明のカード表示システムにおいて使用される本発明のカードである。また各店舗A、Bおよび事務所において、6a、6bはカード5a、5bのリーダライタ、7a、7b、7cはカード表示システムの構成要素であるコンピュータ装置である。

【0012】コンピュータ装置7a、7b、7cはさらに細部より構成されており、8a、8b、8cはCPU (Central Processing Unit) 等から構成されるデータ処理手段である。各店舗A、Bのコンピュータ装置7a、7bにおいて、9a、9bは数値情報、10a、10bは推移情報、11a、11bは目視印字情報、12a、12bは機械読取情報である。これらは取引等の事象の発生とともに入力される可変情報である。また、13a、13bは文字情報、14a、14bは絵柄情報、15a、15bは検索情報である。これらはあらかじめコンピュータ装置7a、7bに登録される半固定情報である。また、事務所のコンピュータ装置7cにおいて、16は顧客情報、17は取引情報、18は商品情報、19は施設情報である。これらの情報は整理されて20のデータベースに登録され、あるいは必要に応じて呼び出される。データベース20には各店舗A、B等を統合管理するための情報、取引等の事象の統計分析情報、等の共有される情報が格納される。

【0013】図2は本発明のカード表示システムで使用されるカードの構成の一例を示す図である。図2において、21は磁気記録が行われる磁気ストライプ、22はICメモリを有するICモジュール、23は光学的な記録と読取が行われる光記録部である。本発明における記録部は、これら磁気ストライプ21、ICモジュール22、光記録部23のすくなくとも1つから構成される。また、24は目視印字情報が印字される表示部である。この書換え可能な表示部の形成方法についての詳細は纏めて後述する。なお表示部、記録部はカードの同一面または異なる面のいずれに存在してもよい。

【0014】図3は本発明のカード表示システムで使用されるカードの表示部とそこへの表示の一例を示す図である。図3において表示部はカードの一方の面の全面が割り当てられている。この一例において、表示部周辺にある複数の人の顔の絵柄と表示部中心にあるメッセージの文字との両者が表示部に印字されている。図3(A)と比較し図3(B)は顔の絵柄31eに示すように顔の絵柄が1つ増えており、他の顔の絵柄はそのままである。図3(A)は図3(B)の1つ前の状態を示し、顔

の絵柄の一連の流れとその増加は推移を示している。またメッセージ32aとメッセージ32bに示すようにメッセージは書換えが行われている。

【0015】図4は本発明のカード表示システムにおけるカードの表示部と記録部への記録の過程を示すフロー図である。次に、図1～図4に基づいて本発明のカードおよびカード表示システムの動作について説明する。前述の図1は一例として店舗に本発明のカード表示システムが適用された場合であるから、店舗においてお客が買物をした場合に発生するポイントの情報をカードに記録するためにカード5aがリーダライタ6aに挿入される。本発明のカード表示システムが医療機関等における定期健康診断に適用される場合はポイントの情報の代わりに健康診断に係わる情報を記録するためにカード5aがリーダライタ6aに挿入される。同様に、進学塾や学校等における学力試験に適用される場合はポイントの情報の代わりに試験成績に係わる情報を記録するためにカード5aがリーダライタ6aに挿入される。

【0016】図4に示すカードの表示部と記録部への記録の過程において、カード5aがリーダライタ6aに挿入されると、まずカード5aの記録部たとえばICモジュール22から推移情報がコンピュータ装置7aに入力される。推移情報はカード5aの表示部に印字されている目視印字情報の推移を示す情報である。図3に示す一例で説明すると、推移情報の開始前の段階は何も表示部に印字されていない状態を示す数値データであり、たとえばICモジュール22の推移情報の格納場所には

“0”が格納されている。次に、目視印字情報である絵柄31aが表示部に印字されると、一つ目の絵柄であるから推移情報の格納場所には推移情報の最初の段階を示す“1”が格納されることになる。このような推移情報がカード5aからリーダライタ6aによって読取られ、コンピュータ装置7aに入力され推移情報10aとなる(S1)。

【0017】次に、数値情報9aが入力される。数値情報9aは前述したポイントの情報、健康診断に係わる情報、試験成績に係わる情報等の数値情報であり、各々に関する事象に基づいて発生する数値である。図3の一例では試験成績であって、メッセージから図3(A)の場合は最終の数値情報が60点、図3(B)の場合は最終の数値情報が100点であることが判る。このような数値情報がキーボード、キャッシュレジスタ、バーコードリーダ等からコンピュータ装置7aに入力され数値情報9aとなる(S2)。なお、上記の説明では推移情報10aが入力されてから数値情報9aが入力されるように説明したが、この順番は限定されるものではなく、いずれが先に行われても差異はない。

【0018】次に、検索情報15a(図1参照)に格納されている検索テーブルの参照が行われる。検索テーブルは数値情報9aに対応するメッセージや絵柄の情報を

示すテーブルである。たとえば、下記の表1に示すようなテーブルである。

【表1】

数値情報	メッセージ(文字情報)	絵柄情報
90～100	M110	P110
70～89	M108	P108
50～69	M106	P106
30～49	M104	P104
.	.	.
.	.	.
.	.	.

【0019】表1においては一行が一纏まりの情報の組である。たとえば、(90～100, M110, P110)、(70～89, M108, P108)、・・・が一纏まりの情報の組である。数値情報9aに基づいて検索テーブルから一纏まりの情報の組が抽出される。たとえば数値情報9aが“100”の場合には(M110, P110)が抽出される(S3)。

【0020】ところで、検索情報15a(図1参照)に格納されている検索テーブルは1つではなく、複数あるとする。すなわち、メッセージや絵柄の情報がグループを成しており、検索テーブルがそのグループ毎に存在するような場合を想定する。たとえば図3に示すような表示はあるグループに基づく表示であり、他のグループに基づく場合には、全く別の表示を行うようにすることができる。どのグループに基づいて表示を行うかは、数値情報9aが意味するところによって決定されるものである。したがって数値情報9aの発生とともにその意味するところによって、推移情報が“0”の場合にはグループ名を入力するとともに記録部に記憶する、あるいは推移情報が“0”でない場合にはグループ名を記録部から読出しそれを利用して検索テーブルの参照を行うことができる。

【0021】次に、検索テーブルから抽出された(M110, P110)に基づいてメッセージや絵柄が選択される。(M110, P110)の“M110”と“P110”はメッセージや絵柄を同定するためのコード情報である。“M110”に基づいて文字情報13aからメッセージが選択され、“P110”に基づいて、絵柄情報14aから絵柄が選択される(S4)。次に、推移情報10aに基づいて選択された文字情報と選択された絵柄情報が配置される。図3に示す一例では、推移情報10aに基づいて次に印字するべき位置に選択された絵柄情報が印字されるように配置が決められる。また、選択された文字情報は書換えが行われるように、既印字情報であるメッセージが消去された後に、その領域に選択された文字情報が印字されるように配置が決められる(S5)。

【0022】次に、上記の配置に基づいて目視印字情報11aが生成される。この目視印字情報11aは選択さ

れた文字情報と選択された絵柄情報の印字イメージのデータであり通常ビットマップデータとして生成される

(S6)。次に、数値情報9aおよび推移情報10aに基づいて機械読取可能な情報である機械読取情報12aが生成される。機械読取情報12aは記録部に記録するデータである。機械読取情報12aは数値情報9aそのものであってもよく、その場合は過去の数値情報のデータ配列の最後に数値情報9aが配置される。この数値情報のデータ配列は推移情報10aそのものであるから、このように機械読取情報12aが生成される場合には推移情報10aが含まれていると見なすことができる。また、過去に発生した数値情報の総和であっててもよく、総和の場合はそれまでの総和に数値情報9aが加算されて新規の総和が生成される。この場合は、機械読取情報12aはこの総和と新規の推移情報とによって構成される(S7)。

【0023】このように、コンピュータ装置7aによって生成された目視印字情報11aと機械読取情報12aはリーダライタ6aに出力され、リーダライタ6aによってカード5aに出力される。すなわち、目視印字情報11aは表示部(たとえば図2の表示部24)に印字され、機械読取情報12aは記録部(たとえば図2の磁気ストライプ21、ICモジュール22、光記録部23のいずれか)に記録される。

【0024】図3に示す一例では、絵柄31dの次の印字領域に絵柄31eが印字されるとともに、図3(A)のメッセージ領域32aのメッセージ“60てんです、もうひといき”を図3(B)のメッセージ領域32bのメッセージ“100てんです、がんばりましたね”に書換えを行う(S8)。以上で、カードの表示部と記録部への記録の過程における本発明のカードおよびカード表示システムの動作についての説明を終える。次に、文字絵柄データと変換テーブルの登録過程における本発明のカードおよびカード表示システムの動作について説明を行う。

【0025】図5は本発明のカードおよびカード表示システムにおける文字絵柄データと変換テーブルの登録過程を示すフロー図である。文字データはエディタ、ワードプロセッサ、日本語入力フロントエンドプロセッサ等を使用しテキストファイルとしてあらかじめ作成しておく。また絵柄データも同様に作図CADにより図形ファイルを作成するかまたは、紙に描いた絵柄をスキャナにより読取り、イメージファイルを作成しておく。そして、文字データと絵柄データをコンピュータ装置7aに入力する。入力された文字データと絵柄データはグループ毎に分類され、グループの中の単位毎にコードによる名称が付される(S11)。次に、検索テーブルを作成する。検索テーブルはたとえば表1に示したようなテーブルであり、数値情報に対応して選択される絵柄データの名称、文字データの名称の組から構成される。このよ

うな検索テーブルを作成する(S12)。次に、文字データを文字情報13aに、絵柄データを絵柄情報14aに格納し、さらに検索テーブルを検索情報15aに登録する(S13)。

【0026】次にカードの表示部の構成方法について説明する。

(低分子複合樹脂) プラスチック基材の上に発熱体層を設け、その上に高分子膜の中に有機低分子物質を粒状に分散させた記録層を設け、さらに保護層でカバーした表示媒体が提案されている(例えば特開昭61-258853号公報)。この複合樹脂からなる白濁状態の記録層は中温度に加熱されると透明になり、室温に戻っても透明性が維持されている。しかし、この状態のものを今度は高温に加熱すると不透明な白濁状態となり、室温に戻ってもその状態を維持し、可逆的な状態変化を示す。従ってサーマルヘッドで中温加熱すれば透明な文字パターンが記録され、記録層のバックを黒にしておけば黒い文字として可視化される。この文字を消去する場合は文字部分を高温加熱するだけでよい。上記の樹脂の組合せの代表的なものは塩酢ビ共重合体とアルキルアクリレート、アルキル(メタ)アクリレートとフッ化ビニリデン系樹脂、ビニルメチルケトンとフッ化ビニリデン系樹脂等があり少なくとも上記組合せの一方を低分子重合体とすればよい。

【0027】(ロイコ染料) ラクトン環を有するロイコ染料に酸性物質が接触するとラクトン環が開環して発色する。発色しているロイコ染料に塩基性物質が接触するとラクトン環が閉鎖して無色のロイコ体に戻る。この可逆反応は無色のロイコ染料に顕減色剤を混入したものを温度制御することによって達成することができる。顕減色剤として没食子酸と高級脂肪族アミンとの塩や、ジヒドロキシ安息香酸と脂肪族アミンとの塩、ロイコ化合物としてクリスタルバイオレットラクトン等が挙げられる。従って、ロイコ染料と顕減色剤を記録層に保持させておけば、サーマルヘッドのような動的熱媒体によって発色させることができ、熱ロール、熱印版のような静的熱媒体で消色させることができる。

【0028】(高分子液晶) 側鎖型高分子液晶の配向状態の変化を加熱/冷却によって可逆的に起こすことができる。即ち、液晶層ガラス状態の白濁した側鎖型高分子液晶を加熱急冷すると等方相ガラス状態の透明な液晶に変わり、等方相ガラス状態の液晶を加熱除冷するとともに液晶相ガラス状態に戻る。以上の高分子液晶を記録層に用いることにより、サーマルヘッドによって感熱紙並みの感度で記録ができ、消去は、ヒートローラー等を用いて行うことができる。

【0029】(液晶/高分子複合膜) 導電性のある基材に液晶/高分子複合膜を設け、加熱によって液晶分子の配向に乱れを起こして白濁化させ、電界印加によりもとの配向に戻して透明化させることができる。液晶物質と

して従来からあるスメクチック液晶がマイクロカプセルに封入され、ポリメチルメタクリレート、ポリカーボネート、ポリビニルアルコール等の高分子マトリックス中に分散されるように使用される。これを用いた記録媒体はサーマルヘッド等の加熱手段で書き込みができ、電極やコロナ放電を用いて電界を印加することによって消去することができる。

【0030】(磁性粉体) マイクロカプセル中に磁場に感応するフレーク状の磁性粉とそれを浮遊させるビヒクルとを封入し、そのマイクロカプセルを黒い基板上にバインダーで固着させ表示部を形成した磁気表示媒体が提案されている(例えば、特開平5-16578号公報)。この表示媒体の表示部は、基板に対する垂直磁場の状態で、磁性粉が垂直配向し、基板により入射光が吸収されて黒く見え、その状態が維持される。しかし、基板に対して水平磁場を与えると、磁性粉は水平配向して、基板への入射光を遮断するので表示部は明るく見える。この明暗の差で文字が記録される。この表示部に対するデータの書き込み、消去は磁気ヘッドによって行うことができる。前記のビヒクルは脂肪酸エステル、アルコールエステル、オキシ酸エステル等の極性液体と低揮発性の脂肪族、芳香族炭化水素の混合物である疎水性液体にポリビニルブチラール、ポリメタクリル酸エステル、エチルセルローズ等を溶解したものである。

【0031】(フォトクロミズムを示す物質) 紫外線又は短波長の可視光線によって無色あるいは淡黄色から青、紫、などに変わり、暗所でもとの色に戻る一連の有機化合物で、例えば、各種のヒドラゾン、オサゾン、フルギドやスチルベン、またサリチルアルデヒド、スピロピラン、ビイミダゾリルなどの誘導体があり、これらの中には固体または溶液でサーモクロミズム(熱によって起こるフォトクロミズムと同様な可逆的な変色)を呈するものや、ピエゾクロミズム(加圧によって起きる可逆的な変色)を示すものがある。

【0032】

【発明の効果】 以上のように本発明によれば、ポイント加算や累積はもちろんのこと、学力試験の成績、クイズやゲームのクリア実績、等の達成度等に関する数値情報が文字絵柄情報として推移の順番に配置される。したがって表現力が向上し、視覚的、感覚的に認知可能となり、カードの利用者に十分に数値情報を伝達することができる。また本発明を適用する各種のアプリケーションで、ある事柄を達成したカード所有者等が特典を受ける場合の照明手段等に利用して、カード利用者に一層のサービス提供を可能とすることができる。また表示情報が

表示の段階を示す数値データである本発明によれば、目視印字情報そのものを表示情報とする場合等と比較してデータ容量を極めて小さくすることができる。また数値情報が達成度を示す情報である本発明によれば、達成度をカードの利用者に十分に伝達することができ、特に顕著な作用効果がある。

【図面の簡単な説明】

【図1】 本発明のカード表示システムが適用された全体構成の一例を示す図である。

【図2】 本発明のカード表示システムで使用されるカードの構成の一例を示す図である。

【図3】 本発明のカード表示システムで使用されるカードの表示部とそこへの表示の一例を示す図である。

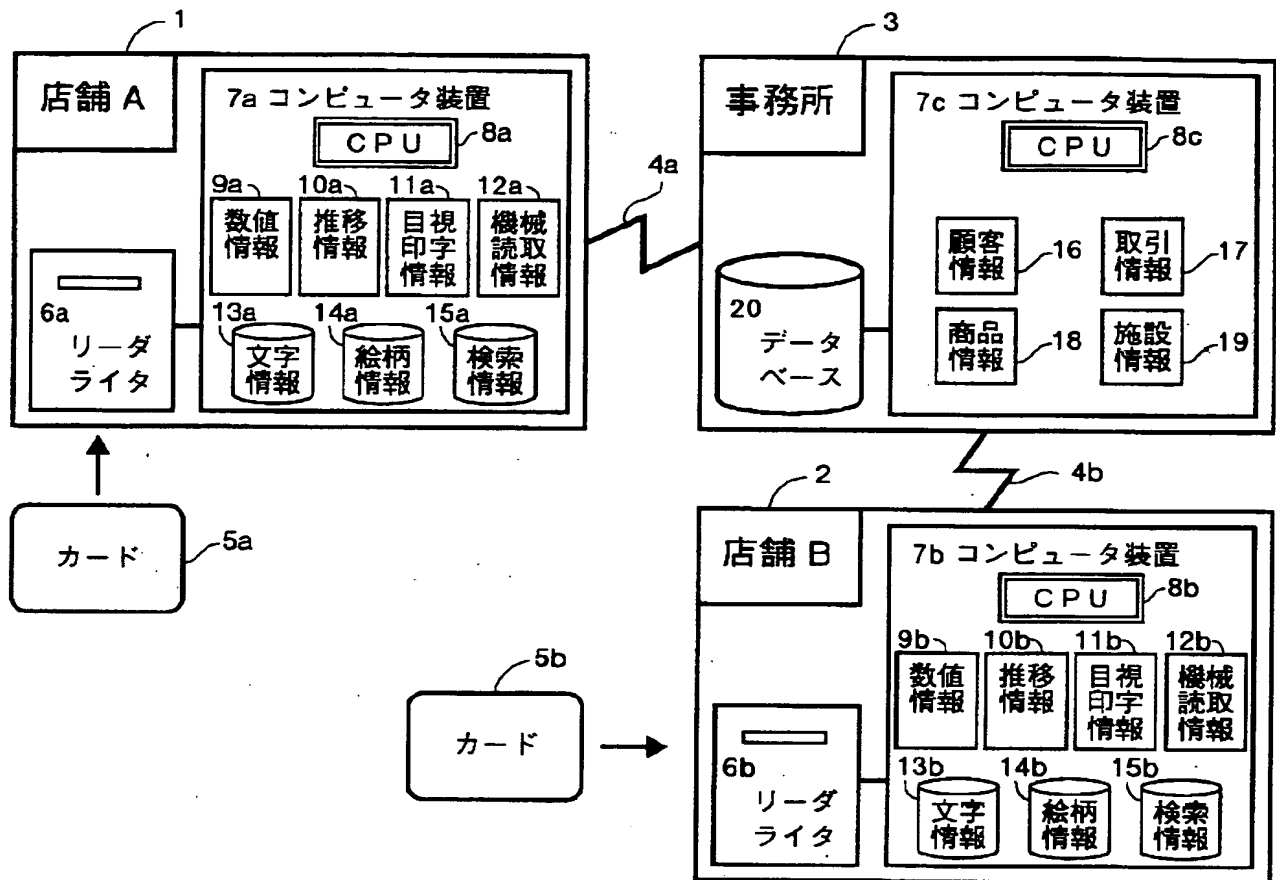
【図4】 本発明のカード表示システムにおけるカードの表示部と記録部への記録の過程を示すフロー図である。

【図5】 本発明のカードおよびカード表示システムにおける文字絵柄データと変換テーブルの登録過程を示すフロー図である。

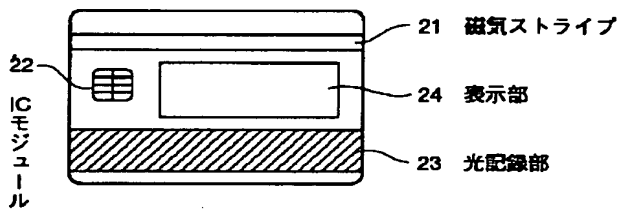
【符号の説明】

- 1 店舗A
- 2 店舗B
- 3 事務所
- 4 a, 4 b 通信回線
- 5 a, 5 b カード
- 6 a, 6 b リーダライタ
- 7 a, 7 b, 7 c コンピュータ装置
- 8 a, 8 b, 8 c 処理手段
- 9 a, 9 b 数値情報
- 10 a, 10 b 推移情報
- 11 a, 11 b 目視印字情報
- 12 a, 12 b 機械読取情報
- 13 a, 13 b 文字情報
- 14 a, 14 b 絵柄情報
- 15 a, 15 b 検索情報
- 16 顧客情報
- 17 取引情報
- 18 商品情報
- 19 施設情報
- 20 データベース
- 21 磁気ストライプ
- 22 ICモジュール
- 23 光記録部
- 24 表示部
- 31 a, 31 b, 31 c, 31 d, 31 e 絵柄
- 32 a, 32 b メッセージ

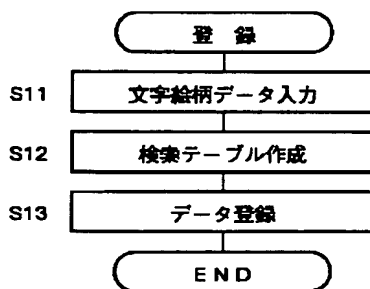
【図1】



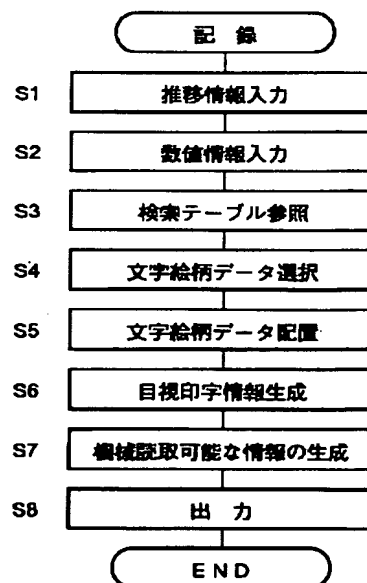
【図2】



【図5】



【図4】



【図3】

